Serial No.: 10/825,860
Docket No.: 01-468US2

CLAIM AMENDMENTS:

1. (Currently amended) An artificial sphincter, comprising:

a cuff that is adapted for placement around a body lumen, said cuff comprising an ~~one or more~~ electroactive polymer actuators; and

a control unit electrically controlling said ~~one or more~~ electroactive polymer actuators to expand or contract said cuff,

wherein said cuff comprises a substrate layer, an electroactive polymer active region that comprises a conductive polymer deposited on said substrate layer, a counter electrode, and an electrolyte disposed between said electroactive polymer active region and said counter electrode.

2. (Currently amended) The artificial sphincter of claim 1, wherein said ~~one or more electroactive polymer actuators comprise (a) one or more~~ cuff comprises a plurality of said electroactive polymer active members, ~~(b) a counter electrode and (c) an electrolyte disposed between said active member and said counter electrode~~.

3. (Currently amended) The artificial sphincter of claim 1, wherein said electroactive polymer active region is electrodeposited on said substrate layer. ~~2, wherein said one or more active members are disposed on at least one substrate layer.~~

4. (Currently amended) The artificial sphincter of claim ~~3~~ 1, further comprising at least one barrier layer.

5. (Original) The artificial sphincter of claim 4, further comprising an exterior mesh layer.

6. (Currently amended) The artificial sphincter of claim ~~3~~ 1, wherein said ~~one or more~~ active members ~~are~~ is provided in a non-linear configuration.

7. (Currently amended) The artificial sphincter of claim ~~3~~ 1, wherein said cuff comprises a plurality of ~~at least two of~~ said substrate layers comprising a deposited electroactive polymer active region. ~~are provided.~~

Serial No.: 10/825,860
Docket No.: 01-468US2

8. (Currently amended) The artificial sphincter of claim ~~3~~ 1, wherein said substrate layer is an electrically insulating layer.

9. (Currently amended) The artificial sphincter of claim 8, wherein conductive lines are provided on said substrate layer to allow electrical communication between said ~~one or more~~ active members and said power source.

10. (Currently amended) The artificial sphincter of claim ~~3~~ 1, wherein said substrate layer is an electrically conductive layer.

11. (Original) The artificial sphincter of claim 1, wherein opposing ends of said cuff are provided with fasteners for securing said cuff around said body lumen.

12. (Original) The artificial sphincter of claim 1, wherein said control unit comprises a power source and a switch.

13. (Original) The artificial sphincter of claim 1, wherein said cuff is adapted for placement around the urethra.

14. (Original) The artificial sphincter of claim 1, wherein said cuff is adapted for placement around the anal canal.

15. (Original) The artificial sphincter of claim 1, wherein said cuff is adapted for placement around the lower esophagus.

16. (Currently amended) The artificial sphincter of claim 15, further comprising a sensing system in communication with said control unit for detecting when food or beverage enters said esophagus.

17. (Currently amended) The artificial sphincter of claim 15, further comprising a sensing system in communication with said control unit for detecting when the stomach is attempting to regurgitate its contents.

18. (Original) The artificial sphincter of claim 1, wherein said electroactive polymer actuators comprise an electroactive polymer selected from the group consisting of polyaniline, polypyrrole, and polyacetylene.

19. (Original) The artificial sphincter of claim 18, wherein said electroactive polymer is polypyrrole.

20. (Original) The artificial sphincter of claim 1, wherein said cuff is provided with a restoring force to bring it into an expanded or contracted state.

21. (Original) The artificial sphincter of claim 20, further comprising at least one elastic structural element, wherein said restoring force is provided by the structural element.

22. (Original) The artificial sphincter of claim 21, wherein said at least one elastic structural element is an elastic annular tube structure whose length increases upon a decrease in its cross-sectional diameter.

23. (Currently amended) The artificial sphincter of claim 1, further comprising a sensing system in communication with said control unit for sensing the degree of contraction of said electroactive polymer actuators.

24. (Currently amended) The artificial sphincter of claim 23, wherein said sensing system comprises a plurality of strain gauges in communication with said control unit.

25. (Original) A method of treating fecal incontinence comprising implanting into a patient the artificial sphincter of claim 14.

Serial No.: 10/825,860
Docket No.: 01-468US2

26. (Original) A method of treating urinary incontinence comprising implanting into a patient the artificial sphincter of claim 13.

27. (Original) A method of treating gastro-esophageal reflux disease comprising implanting into a patient the artificial sphincter of claim 15.

28. (Original) The artificial sphincter of claim 1, wherein said control unit comprises a power source and a computer.

29. (Currently amended) An artificial muscle patch, comprising:

~~one or more~~ an electroactive polymer actuators; and

a control unit electrically controlling said ~~one or more~~ electroactive polymer actuators to expand or contract said artificial muscle patch, wherein said patch comprises a substrate layer, an electroactive polymer active region that comprises a conductive polymer deposited on said substrate layer, a counter electrode, and an electrolyte disposed between said electroactive polymer active region and said counter electrode, and wherein said patch is adapted for placement ~~to be implanted~~ adjacent a patient's heart.

30. (Currently amended) The artificial muscle patch of claim 29, wherein said patch comprises a plurality of ~~one or more electroactive polymer actuators comprise (a) one or more~~ active members, ~~(b) a counter electrode and (c) an electrolyte disposed between said active members and said counter electrode~~.

31. (Currently amended) The artificial muscle patch of claim 29, wherein said electroactive polymer active region is electrodeposited on said substrate layer. ~~30, wherein said one or more active members are disposed on at least one substrate layer.~~

32. (Currently amended) The artificial muscle patch of claim ~~31~~ 29, which further comprises at least one barrier layer.

33. (Original) The artificial muscle patch of claim 32, further comprising an exterior mesh layer.

34. (Currently amended) The artificial muscle patch of claim ~~31~~ 29, wherein said ~~one or more~~ active members ~~is are~~ provided in a nonlinear configuration.

35. (Currently amended) The artificial muscle patch of claim ~~31~~ 29, wherein said patch comprises a plurality ~~at least two~~ of said substrate layers comprising a deposited electroactive polymer active region. ~~are provided.~~

36. (Currently amended) The artificial muscle patch of claim ~~31~~ 29, wherein said substrate layer is an electrically insulating layer.

37. (Currently amended) The artificial muscle patch of claim 36, wherein conductive lines are provided on said substrate layer to allow electrical communication between said ~~one or more~~ active members and said power source.

38. (Currently amended) The artificial muscle patch of claim ~~31~~ 29, wherein said substrate layer is an electrically conductive layer.

39. (Original) The artificial muscle patch of claim 29, wherein said control unit comprises a power source and a switch.

40. (Original) The artificial muscle patch of claim 29, wherein said control unit comprises a power source and a computer.

41. (Currently amended) The artificial muscle patch of claim 29, further comprising a sensing system in communication with said control unit for detecting a patient's heartbeat, wherein said control unit paces the contraction and expansion of said electroactive polymer actuators with said heartbeat.

42. (Original) The artificial muscle patch of claim 29, wherein said control unit paces the heart as well as the contraction and expansion of said electroactive polymer actuators.

43. (Original) The artificial muscle patch of claim 29, wherein said electroactive polymer comprises polypyrrole.

44. (Original) A method of treating congestive heart failure, comprising implanting the artificial muscle patch of claim 29 adjacent a patient's heart.